

REMARKS

The Examiner objected to the drawings, and particularly FIG. 4, for failing to include reference numeral "21." The applicant includes a proposed drawing correction wherein the applicant proposes to add reference numeral "21" to FIG. 4 as indicated in red ink. No new matter will be introduced upon making this change. Upon receiving approval of this proposed drawing correction, a corrected drawing will then be submitted.

The Examiner has objected to the specification as containing certain informalities with respect to reference numeral "51." In particular, the Examiner suggests that reference numeral "51" should appear next to the word "click" in various specified locations of page 6. Pursuant to this amendment, the applicant has presented the requested change and therefore submits that the noted informalities have been resolved.

Claims 1 through 22 have been rejected under 35 U.S.C. 112, first paragraph. The Examiner questions the enablement offered by the application description with respect to:

- "[H]ow an angle of directional movement for the on-screen cursor is established in response to sensing at least some of the first electromyogram signals;" and
- "How does the processor translate the electromyogram signals into display indicator (or cursor) movement information?"

There is no requirement, of course, that a specification set forth every required detail with respect to making and using a particular invention. In fact, the rules of the Patent Office actively discourage such an approach, preferring instead that an applicant express and focus upon those aspects that constitute the new aspects. In the present instance, the applicant describes a new way of causing a computer screen cursor to be moved (or clicked) by a user. Cursor movement mechanisms and techniques are virtually ubiquitous in modern society and those skilled in the art are well aware of many instances of both. As one simple illustration of this point, a recent search of the United States Patent Office website using the search terms "cursor" and "movement" (as constrained to appearances in the title of a relevant reference) yielded the following results:

Pat. No.	Title
1 6,559,873	Displaying menu choices adjacent to spatially isolating regions enabling different cursor movement speeds and other user notification means
2 6,392,675	Variable speed cursor movement
3 6,342,877	Method for constrained cursor movement

Pat. No.	Title
4 6,292,203	Method of enhancing the resolution of cursor movement on the display screen of a video display system
5 6,031,531	Method and system in a graphical user interface for facilitating cursor object movement for physically challenged computer users
6 5,995,079	Method for controlling a variable of a dialog box with cursor movement
7 5,973,674	Input device for controlling cursor movement on the screen of a computer
8 5,818,423	Voice controlled cursor movement
9 5,748,180	Pointing device for controlling cursor movement on display
10 5,713,042	Document processing apparatus for controlling cursor movement and a method for processing a document in an apparatus operable in a plurality of editing modes
11 5,673,087	Screen overlay device for outputting cursor coordinates based on movement of a pointing device and an on-screen display relating to a menu and a method therefor
12 5,655,066	Remote display of objects and cursor movement in a conferencing system
13 5,519,827	Method and apparatus for changing screen image data based on cursor movement relative to a preset mark on the screen
14 5,510,811	Apparatus and method for controlling cursor movement
15 5,504,500	User programmable orientation of cursor movement direction
16 5,477,236	Method and apparatus for controlling movement of cursor
17 5,398,044	Method of and an arrangement for controlling the cursor movement on a graphical display
18 5,367,315	Method and apparatus for controlling cursor movement
19 5,327,528	Method and apparatus for cursor movement control
20 5,298,890	Discontinuous movement system and method for mouse cursor
21 5,278,557	Cursor movement control key and electronic computer keyboard for computers having a video display
22 5,027,109	Apparatus and method for minimizing undesired cursor movement in a computer controlled display system
23 4,931,781	Cursor movement control key switch
24 4,101,879	Cursor movement control device for screen-segmented display apparatuses

Clearly, those skilled in the art know *how* to move a cursor in response to a given input. Furthermore, the applicants do not claim to have invented a new way of moving a cursor as such. Rather, the applicants have invented a new input mechanism and process by which muscular movements can be translated into electrical signals that are then otherwise usable in conjunction with a cursor movement platform and mechanism of choice. That is, the applicant's biometrically-based process is essentially compatible with likely any known or hereafter developed cursor movement platform. Consequently, the details of how one moves a cursor, presuming that the basic movement signals are otherwise available, are not especially relevant to a description of this invention and were left unexpressed in the

specification in order to cater to the brevity sought by the Patent Office and to otherwise ensure clarity and focus with respect to the applicant's teachings.

And, to be sure, the applicants have indeed provided considerable explanation regarding how such cursor control signals can be provided. The specification is replete with such explanatory references as these:

“Pursuant to one embodiment, a first biometric signal, such as an electromyogram signal, is sensed and utilized to establish the angle of directional movement information for an on-screen cursor [page 3, lines 10-12].”

“When a first electromyogram signal is sensed 12, the angle of movement for a display indicator is established 13 [page 3, lines 23-24].”

“When a given muscle contracts, a small corresponding electrical signal occurs. Such a signal can be detected by an electromyogram sensor as well understood in the art. Such sensors typically provide an output voltage that corresponds to the strength of the musculature electrical signal [page 3, lines 29-32].”

“An overall system 30 as depicted in FIG. 3 includes a processor 32 that functions in this embodiment as a signal translator and that couples to the two electromyogram sensors 21A and 21B. The processor 32 can be, for example, an HC11 family device as offered by Motorola, Inc. The electromyogram sensors 21A and 21B couple to analog to digital inputs of the processor 32 through voltage shifting and scaling units 31A and 31B . . . [page 4, lines 11-16].”

“[T]he electromyogram signal is utilized to establish 53 a corresponding angle of directional movement for the display indicator. This information can then be optionally used to rotate the corresponding screen symbol. For example, an on-screen cursor 61 may have a starting position and orientation as depicted in FIG. 6. Based upon the angle of directional movement as established 53 by the processor 32, the on-screen cursor 61 can be rotated 71 as depicted in FIG. 7. The amount of rotation 71 can comprise a function of the magnitude and/or duration of the electromyogram signal (and hence the magnitude and/or duration of the monitored muscle flexing). Rotation 71 of the on-screen cursor 61 can either be done after the signal has been fully processed or during processing of the signal [page 6, line 25-page 7, line 2].”

“For some purposes, it may be inappropriate to rotate the on-screen cursor 61 in itself (this can be particularly true when the on-screen cursor 61 has no particular directional orientation itself that will usefully suggest to the user the resultant angle of directional movement). In such a situation, it may be appropriate to provide an on-screen directional indicator 81 in conjunction with the on-screen cursor 61 as depicted in FIG. 8. As shown in FIG. 9, this on-screen directional indicator 81 can be rotated as described above while leaving the on-screen cursor 61 in an unrotated state. Various on-screen directional indicators can of course be utilized and can be placed in various positions with respect to the on-screen cursor [page 7, lines 7-17].”

As can be seen, the applicant has provided considerable enabling description as pertains to the invention and its manner of use. In particular, the applicant has provided both textual descriptions and illustrative examples of how the small bio-signals that correspond to the contraction of a muscle can be detected and provided for use in controlling both a direction of movement and a magnitude of movement. For example, specific examples are provided to depict and explain that a degree of contraction of a muscle can be used to rotate a cursor (or some other directional depictor on a display screen) to thereby indicate a selected angle of directional movement and how a degree (or duration) of contraction of a different muscle can be used to cause movement of the cursor along in the selected direction.

As an immediately available example of how well understood and recognized this art is, the applicant notes the extent to which the Examiner's primary prior art reference, Wood et al., relies upon knowledge which is already in the possession of those skilled in the art in this regard. Wood explains his process in terms such as these:

“[D]ata from the sensors is processed through the software and may be interpreted by the computer as a movement of the mouse in one direction [column 5, lines 14-16].”

“First and second wires 24 and 26 are coupled to a converter or interface device 30 which outputs a conditioned and digitized or converted signal through a wire 32 to an input port 34 in a computer 36. The converted signal can be used to drive a computer game running in computer 36 . . . [column 6, line 65-column 7, line 3].”

The applicant therefore vigorously disputes the Examiner's characterization of the description as being non-enabling in any regard and asserts that the description provided is more than enabling to a person skilled in the art.

Claims 1-22 have been rejected under 35 U.S.C. 102(e) given Wood et al. (U.S. Patent No. 6,413,190) (“Wood”). Although Wood does disclose the possible use of electromyogram sensors for use in moving an on-screen cursor or game piece, Wood speaks only of horizontal or vertical motion with respect to that cursor or game piece movement. The applicant, in claim 1, specifies using a first electromyogram signal to establish an angle of directional movement for an on-screen cursor and a second electromyogram signal to move that on-screen cursor in the now determined direction. Since Wood makes no teaching in this regard, Wood cannot be said to anticipate claim 1.

Claim 2 is dependent upon claim 1, which claim has been shown allowable above. In addition, claim 2 introduces additional subject matter that, when considered in context with the recitation of the claim from which it depends, constitutes additional incremental patentable subject matter. For example, although Wood notes that multiple electromyogram signals may be used, Wood also suggests a preference for joint-based sensing, and Wood further makes no suggestion that multiple electromyogram signals can be used to establish, respectively, an angle of directional movement for an on-screen cursor and movement of the on-screen cursor in an angle of directional movement as was previously established. For all these reasons, the applicant respectfully submits that claim 2 may be passed to allowance.

Claims 3 and 4 are dependent upon claim 1, ultimately, which claim has been shown allowable above. In addition, these claims introduce additional incremental patentable subject matter. For example, claim 3 provides specifics with respect to rotation of an on-screen directional indicator and claim 4 further specifies that the directional on-screen indicator can comprise rotation of an on-screen cursor itself. Wood makes no teachings with respect to effecting a particular angle of directional movement in the first instance, and certainly makes no teachings or suggestions with respect to rotating an on-screen directional indicator to facilitate such a process. For all these reasons, the applicant respectfully submits that claims 3 and 4 are allowable. Remaining claims 5-13 are ultimately dependent upon claim 1, which claim has been shown allowable above. Again, these claims also introduce additional subject matter that, particularly when considered in context with the claim or claims from which they depend, constitutes incremental patentable subject matter. For example, claim 6 specifies wireless transmission of information that corresponds to an angle of directional movement for an on-screen cursor. Claims 7, 8, and 9 refer variously to level shifting and scaling the electromyogram signals that are used to facilitate provision of the angle of directional movement process. Claims 10-12 provide specificity with respect to asserting a mouse click in response to sensing an electromyogram signal (Wood makes no suggestion or teaching whatsoever with respect to using his biometric signals to effect a mouse click). Therefore, for all these reasons, the applicant respectfully submits that claims 5-13 may be passed to allowance.

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The Examiner has rejected apparatus claims 14-20, finding them to be similar in scope to claims 1-13 and has rejected claims 14-20 under the same rationale. With all due respect, the applicant submits that the same observations put forth above with respect to claims 1-13 are variously applicable to claims 14-20 and will therefore not repeat those observations for the sake of brevity. The applicant does respectfully submit that claims 14-20 are allowable. Claims 21 and 22 were also found to be similar in scope to claims 1 and 10 and were again rejected under the "same rationale." The applicant submits that the observations put forth above are applicable here as well, at least in part, and respectfully submits that claims 21 and 22 may be passed to allowance.

There be no other objections to or rejections of the application or the claims, the applicant respectfully submits that the above rejections have been traversed and that claims 1-22 may be passed to allowance.

Respectfully submitted,

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